

Lowering the risk of infection with grapes

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Consuming grapes may help reduce infection risk in obese people, ARS research suggests. Credit: Jack Dykinga

Nearly 35 percent of Americans—about 79 million—are obese, putting them at higher risk of developing heart disease, diabetes, and bacterial and viral infections. Natural compounds, called "phytochemicals," found in fruits like grapes and strawberries may help reduce these risks.

In previous research, molecular biologist Susan Zunino, with the Agricultural Research Service's Western Human Nutrition Research Center (WHNRC) in Davis, California, was the first to show a link between eating grapes and preventing type 1 diabetes in mice. Now she has found that grape consumption by obese humans may decrease blood levels of certain types of fats linked to heart disease and reduce the risk for developing infections.

Zunino, who works in the WHNRC's Immunity and Disease Prevention Unit, is studying phytochemicals to determine whether they could help obese people fight off infection.

"Documentation of viral and bacterial infection in hospitals and clinics has shown that [obese people](#)

are at a much higher risk for developing infections after surgery," Zunino says. "During the H1N1 influenza pandemic in 2009, many more obese individuals than people of normal weight were admitted to hospitals because they could not overcome the virus."

In Zunino's recent study, 24 obese individuals were given grape powder or a placebo, which they mixed with water and drank twice a day. This study was a crossover study, meaning that each participant drank either the placebo or grape powder for 3 weeks, and then, after a "washout" period, the participant switched to the opposite powder for another 3 weeks.

"This design allows each person to act as their own control for measuring responses to the grape powder," Zunino says. Freeze-dried whole table grapes—green, red, and purple—were used by the California Table Grape Commission to make the grape powder.

During the 9-week study, scientists took blood samples at six different times to measure the effects of grapes on blood lipids (fats), blood markers of inflammation, and cells of the immune system. Compared to the placebo group, volunteers in the grape-powder group had reduced plasma concentrations of low-density lipoprotein (LDL), also known as "bad" cholesterol, and LDL particles, both of which are involved in [heart disease](#).

"We isolated immune cells from the blood and stimulated the cells with a component of bacteria called 'lipopolysaccharide,'" Zunino says. "We saw a 14- to 17-percent increase in the production of proteins—cytokines—from monocytes that are instrumental in fighting off infections."

Zunino found a similar occurrence in a study with strawberries. One of the same cytokine proteins was produced when [obese individuals](#) consumed strawberry powder. People who consumed either grape or strawberry powders in two separate

studies had increased production of cytokines in response to the bacterial component, she adds.

"However, being obese leads to more inflammation in the body, and we do not know yet if the increase in production of these cytokines after eating these fruits may contribute to more inflammation or if they will be beneficial in reducing infections," Zunino says. "More studies need to be done."

Zunino plans to conduct other studies in [obese mice](#) to see whether phytochemicals can actually help fight off infection. "I can do a much more detailed analysis with the monocytes to see what types of receptors might be stimulated that could be involved in increasing the ability of obese animals to fight off infections," she says.

Provided by Agricultural Research Service

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